Market Liquidity after the Financial Crisis*

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* Views expressed are those of the presenter and not necessarily those of the Federal Reserve Bank of New York or the Federal Reserve System.
Reported Worsening of Bond Market Liquidity

- “People Are Worried About Bond Market Liquidity,” Bloomberg View, June 3, 2015
- “Who Will Fare Best In Bond-Market Liquidity Crunch?” Wall Street Journal, July 1, 2015
Often Attributed to Regulatory Changes

• “Market participants are concerned that banks holding fewer bonds on their books as result of post-crisis capital requirements … could cause a liquidity crunch when rates rise and investors look to sell.” (WSJ, 7/1/15)
• “Rules implemented after the 2008 financial crisis, such as Dodd-Frank and Basel III, have made it costly for bond dealers to hold large inventories of Treasuries on their balance sheets.” (Bloomberg News, 1/24/16)
• “The liquidity crunch has come about because banks and other counterparties, the traditional middlemen in fixed income trading, have significantly reduced their bond inventories because of stricter regulations” (FT, 3/20/16)
Dealer Balance Sheets Have Stagnated

Note: Total financial assets of security brokers and dealers at subsidiary level.
UBS Trading Floor Then (2008) and Now (2016)
Metrics Suggest Less Abundant Funding Liquidity

Note: CDS-bond basis = average difference between each bond’s market CDS spread and theoretical CDS spread implied by bond yield; calculated for investment grade bonds.
What We Do

• Discuss drivers of liquidity and dealer behavior post-crisis
  – Tighter regulatory environment
  – Consequences of housing boom and bust
  – Changes in market structure
  – Growth in market and changes in liquidity demand
  – Market environment

• Assess liquidity of Treasury and corporate bond markets

• Discuss limitations of analysis
What Is Market Liquidity?

• The cost of quickly converting a desired quantity of an asset into cash, or cash into an asset (at an efficient price)
• Several dimensions: cost, depth, immediacy, (efficiency)
• Look at numerous measures to assess
Why Should We Care?

- Liquidity promotes the efficient allocation of capital
- Liquidity is priced, and hence affects financing costs
- Liquidity is needed for monetary policy implementation
- Liquidity is important to financial stability
The Post-Crisis Trading Environment
Timeline of Regulatory Changes

Source: Adrian, Boyarchenko, and Shachar (2017).
Dealer Balance Sheets Have Stagnated

Note: Total financial assets of security brokers and dealers at subsidiary level.
Dealer Balance Sheet Expansion and Contraction

Note: Figure compares asset growth pre-crisis to asset growth post-crisis for primary dealers. Circles are scaled to reflect dealer size in pre-crisis period.
October 15, 2014 Flash Rally

Note: Intraday plot of 10-year Treasury yield on October 15, 2014.
Growing Importance of Principal Trading Firms

Bank/Dealer: 37%
Non-bank Dealer: 4%
PTF: 54%
Hedge Fund: 5%

Note: Trading volume shares in interdealer Treasury market on October 15, 2014.
Growth in Debt Markets

Note: Marketable Treasury debt only.
Mutual Fund Ownership of Corporate Bonds

Note: Corporate & foreign bonds (held in U.S.) owned by mutual funds & ETFs divided by outstanding.
Fed Funds Rate and Implied Rate Volatility

Note: MOVE = Merrill Lynch Option Volatility Estimate (measure of implied interest rate volatility).
Dealer Debt Security Positions and Expected Returns

Note: Dealers’ debt securities/total financial assets and expected fixed income returns (10-year Treasury term premium + Baa-Aaa credit spread).
Evidence on Market Liquidity
(First Treasuries, then corporates)
Primary Dealer Trading Volume Has Been Stable

Note: 4-week moving average of average daily trading volume.
Primary Dealer Turnover Has Declined Sharply

Note: 4-week moving average of average daily trading volume divided by marketable debt outstanding.
Trade Sizes Have Declined

Note: 21-day moving averages of average daily trade size for on-the-run notes in interdealer market.
Bid-Ask Spreads Narrow and Stable

Note: 21-day moving averages of average daily spreads for on-the-run notes in interdealer market.
Depth Has Declined Somewhat

Note: 21-day moving averages of average daily depth for on-the-run notes in interdealer market. Depth is summed across top five levels of both sides of the order book.
But Price Impact Low by Historical Standards

Note: 4-week moving averages of slope coefficients from weekly regressions of five-minute price changes on five-minute net order flow for the on-the-run notes in interdealer market.
Corporate Bond Issuance At Record Highs

$ Billions

Source: SIFMA.
Trading Volume Has Increased Modestly

Note: Average daily trading volume by quarter. Source: SIFMA.
Trade Sizes Have Declined

Note: 21-day moving average of average trade size.
Overall Bid-Ask Spreads Narrower than Ever

Note: 21-day moving average of realized bid-ask spreads, calculated daily for each bond as difference between average dealer-to-client buy price and average dealer-to-client sell price.
Spreads Diverge Depending on Trade Size

Note: 21-day moving average of realized bid-ask spreads for different trade size groupings.
Evidence on Liquidity Summary

- Best measures suggest no deterioration (Treasury and overall corporate bid-ask spreads) or modest deterioration (Treasury depth and price impact, corporate spreads for large trades)
- Other measures suggest change in market, but not necessarily a reduction in liquidity (trade size)
- Not clear that turnover suggests worse liquidity (although it may raise question as to why liquidity is not better than it is)
- Markets appear healthy overall (corporate issuance)
Other Broad Evidence (Corporates) Is Consistent

- Trebbi and Xiao (2015): lack of evidence of liquidity deterioration or breaks in liquidity risk
- Anderson and Stulz (2017): lower transaction costs and price impact post-crisis, albeit somewhat higher for large trades
Why Evidence is Incomplete
Treasury Liquidity Limitations

- Evidence is for interdealer market, not dealer-customer market
  - Dealer-to-customer data collection started July 10, 2017
- Structural changes may mask liquidity changes
  - PTFs promote intraday liquidity, but tend to not take large positions or hold positions overnight
- Concerns may be about liquidity risk (not average liquidity)
- Concerns may be about liquidity for off-the-run securities
- Concerns may be about future liquidity, as policy normalizes
Corporate Liquidity Limitations

- Evidence is less direct, based on transactions
  - Cannot directly observe bid-ask spreads or depth
- Measures don’t capture trades that do not occur
- Structural changes may mask liquidity changes
  - Some evidence that dealers are shifting from principal model to agency model of intermediation
- Concerns may be about future liquidity or liquidity risk
More Focused Evidence

• Bao, O’Hara and Zhou (2016): higher price impact post-Volker for recently downgraded bonds
• Dick-Nielsen and Rossi (2016): price of immediacy increased post-crisis vs pre-crisis
• Choi and Huh (2016): dealers providing liquidity for fewer trades (and at higher cost)
• Bessembinder, et al. (2016): less dealer capital commitment
• Adrian, Boyarchenko, and Shachar (2017): liquidity provision declined for dealers more constrained by regulations
Overall Summary

• Many drivers of liquidity: regulation, willingness to take risk, market structure, liquidity demand, market environment
• Quantitative measures provide limited evidence of a broad deterioration in liquidity in Treasury and corporate markets
• These measures don’t fully capture liquidity (inadequate data and structural changes)
• Moreover, concerns may reflect liquidity risk or prospects for future liquidity